Scope, Schedule, & Budget

Project Planning and Siting Issues for Wind Farms in Indiana

WIndiana 2008

June 17-18

Indianapolis, IN

BHE ENVIRONMENTAL

DEFINING ENVIRONMENTAL SOLUTIONS

Agenda

1. Overview of Siting Requirements
2. On-Time & Within Budget
3. Critical Siting Issues
4. Managing the Siting Process

1 What are Siting Issues?

Successful project siting starts by answering some basic questions, and by integrating the answers:

1. What kind of a project?
2. Can you build it here?
3. What do you need to know?
4. How do you plug it in?
5. How do you get rid of it when you are done?

1 What are Siting Issues?

Some examples:

- Wind resource availability
- Land Acquisition
- Permitting/Policy directives
  - Zoning
  - Environmental
  - FAA & Military Radar
  - Traffic & Building Permits
- Transmission
- Small wind v. utility scale
- Decommissioning standards & Requirements

1 What are Siting Issues?

Our focus today:

Once you know you want to build it, what do you need to know to site your project?

- ✓ Wind resource availability
- ✓ Land Acquisition
- Permitting/Policy directives
  - Zoning
  - Environmental
  - FAA & Military Radar
  - Traffic & Building Permits
- ✓ Transmission
- ✓ Small wind v. utility-scale
- ✓ Decommissioning standards & Requirements

1 Wind Project Siting Requirements

- NEPA/Federal regulatory compliance
- Local/State Permitting Zoning, Siting Restrictions, Ordinances
- Ecological
  - Wildlife, Avian Impacts, Bats, Endangered Species
  - Community Assessment/ Conservation
  - Wetlands Delineation, Permitting
- Cultural Resources Historic Properties, Archeology, Recreation, Aesthetics, Community Values

1 Wind Project Siting Requirements

- NPDES, Erosion & Sediment Control, Floodplains
- Visual Impact Assessment: Viewshed, Photosimulation, Flicker
- Economic Impact
- Noise Mapping & Impact Assessment
- Traffic
- FAA
- Communications, Radar, & Microwave Impact Analysis

1 Wind Project Siting Requirements

… some of these siting issues are unique to utility scale wind projects, but many are not

Unique challenges

- big wind projects
- new/developing siting requirements
- critical issues

Example Project Schedule

2 Staying on Time & within Budget

- Early project scoping
- Critical issues analyses (red flags, fatal flaws)
- Don’t underestimate the time it will take to meet environmental requirements
- Remember that issues are interrelated
- Have a plan & use tools to manage critical issues

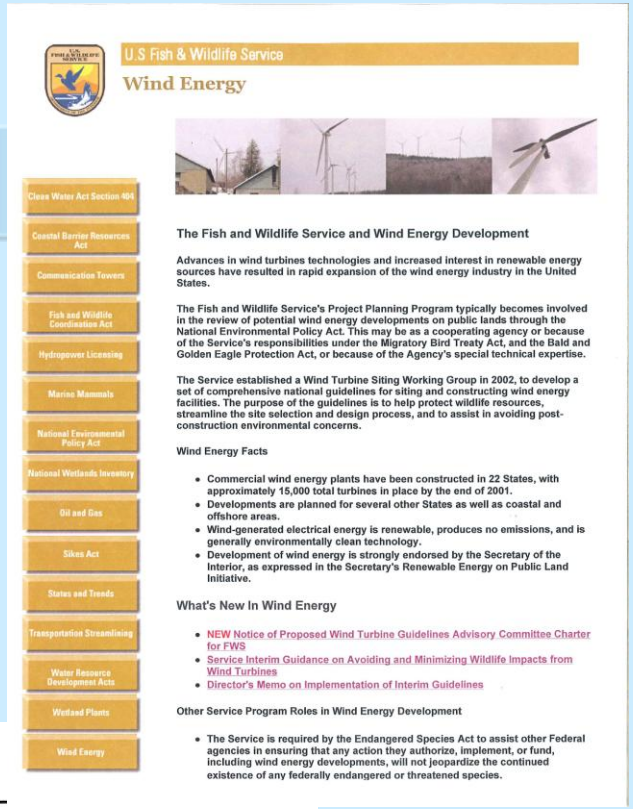
3 Critical Siting Issues

- What are the Critical Siting Issues?
- Understanding Siting Challenges
- Resolving Constraints & Optimizing Opportunities

3 Critical Siting Issues

Permitting: the changing landscape

- Current regulations
- Federal/State/Local/"Home Rule"
- Indiana
- What to expect
- New directions



U.S Fish & Wildlife Service

Wind Energy

Clean Water Act Section 404
Coastal Barrier Resources Act
Communication Towers
Fish and Wildlife Coordination Act
Hydropower Licensing
Marine Mammals
National Environmental Policy Act
National Wetlands Inventory
Oil and Gas
Sikes Act
States and Trends
Transportation Streamlining
Water Resource Development Acts
Wetland Plants
Wind Energy

The Fish and Wildlife Service and Wind Energy Development

Advances in wind turbines technologies and increased interest in renewable energy sources have resulted in rapid expansion of the wind energy industry in the United States.

The Fish and Wildlife Service's Project Planning Program typically becomes involved in the review of potential wind energy developments on public lands through the National Environmental Policy Act. This may be as a cooperating agency or because of the Service's responsibilities under the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act, or because of the Agency's special technical expertise.

The Service established a Wind Turbine Siting Working Group in 2002, to develop a set of comprehensive national guidelines for siting and constructing wind energy facilities. The purpose of the guidelines is to help protect wildlife resources, streamline the site selection and design process, and to assist in avoiding post-construction environmental concerns.

Wind Energy Facts

- Commercial wind energy plants have been constructed in 22 States, with approximately 15,000 total turbines in place by the end of 2001.
- Developments are planned for several other States as well as coastal and offshore areas.
- Wind-generated electrical energy is renewable, produces no emissions, and is generally environmentally clean technology.
- Development of wind energy is strongly endorsed by the Secretary of the Interior, as expressed in the Secretary's Renewable Energy on Public Land Initiative.

What's New In Wind Energy

- NEW Notice of Proposed Wind Turbine Guidelines Advisory Committee Charter for FWS
- Service Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines
- Director's Memo on Implementation of Interim Guidelines

Other Service Program Roles in Wind Energy Development

- The Service is required by the Endangered Species Act to assist other Federal agencies in ensuring that any action they authorize, implement, or fund, including wind energy developments, will not jeopardize the continued existence of any federally endangered or threatened species.

ORDINANCE NO._____

AN ORDINANCE AMENDING CHAPTER _____ OF ORDINANCE NO._____ BEING THE UNIFIED ZONING ORDINANCE OF TIPPECANOE COUNTY.

Be it ordained by the (County Commissioners of Tippecanoe County, Indiana; the Common Council of the City of Lafayette, Indiana; the Common Council of the City of West Lafayette, Indiana; the Town Council of the Town of Battle Ground, Indiana; the Town Council of the Town of Dayton, Indiana; and the Town Council of Clarks Hill, Indiana), that Ordinance No._____, being the Unified Zoning Ordinance of Tippecanoe County is hereby amended as follows:

Section 1: Change **UZO Section 1-10-2 Words and Terms Defined** to add the following definitions:

Large Wind System. A ***WECS*** that has a nameplate capacity (manufacturer's rating) of more than 50 kilowatts per ***wind tower***, or a ***total height*** of more than 100', or a ***swept area*** of more than 30'. Any ***WECS*** meeting one or more of these criteria shall be considered a ***large wind system***.

3 Critical Siting Issues

Visual Impact Assessment

Purpose

- Evaluate the visibility of the proposed project
- Compare landscape with and without the project
- Provide information to decision makers & public
  - understand potential visual impacts
  - make an informed judgment about aesthetic impacts

3 Critical Siting Issues

Visual Impact Assessment

- No specific Federal rules, regulations, or policies govern evaluation of visual resources
- Uses standards & procedures from
  - National Forest Service
  - Bureau of Land Management
  - Federal Highway Administration
  - State agencies

3 Critical Siting Issues

Visual Impact Assessment

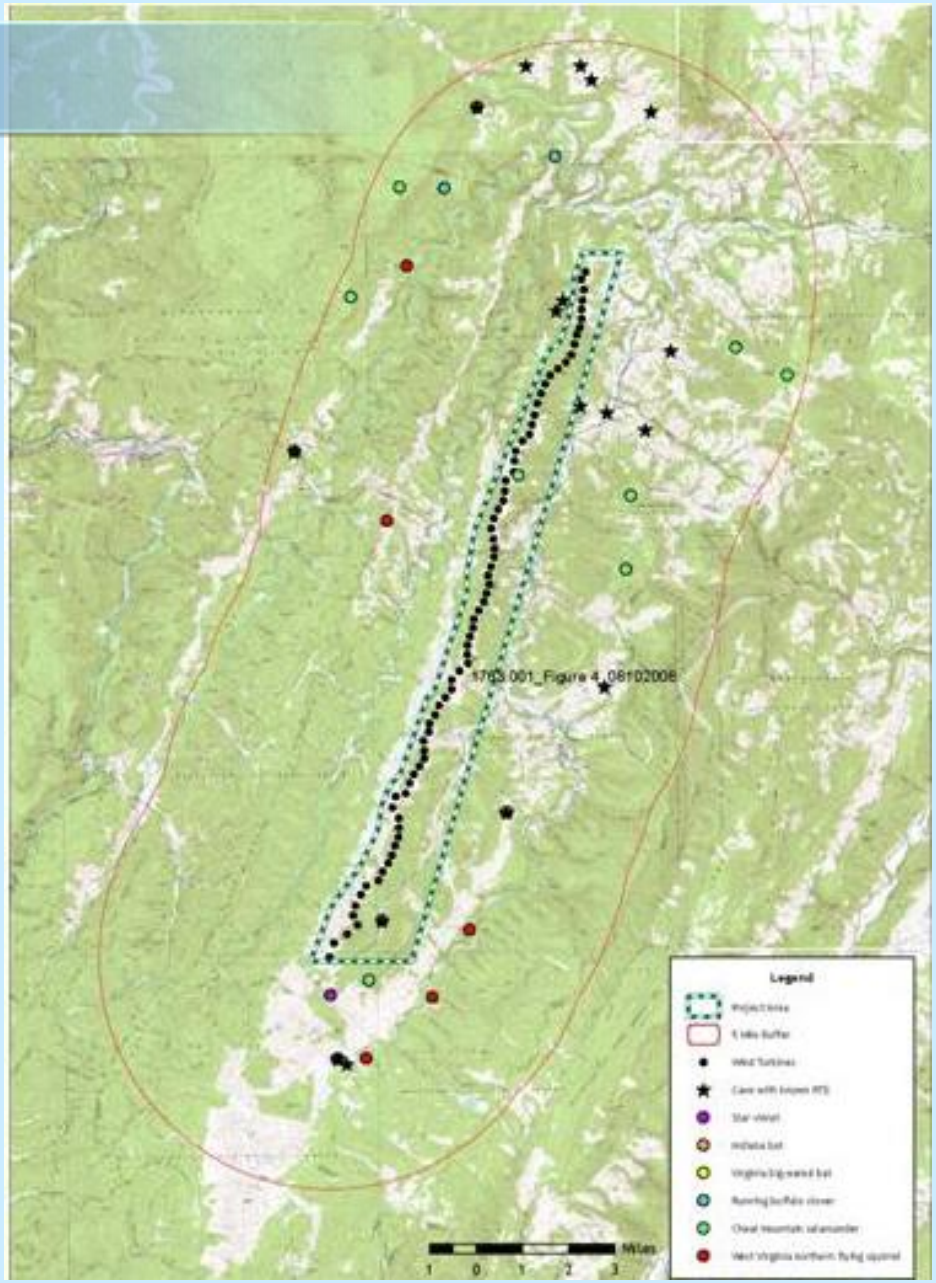
- Quantitative (how much is seen, from what locations = visual impact)
- Qualitative (how it will be perceived = aesthetic impact)

Steps:

1. Define existing landscape
2. Conduct visibility analysis
3. Identify sensitive aesthetic resources
4. Select key receptors
5. Depict the appearance of the completed facility
6. Evaluate aesthetic effects of the visual change from project construction & operation
7. Identify opportunities for mitigation

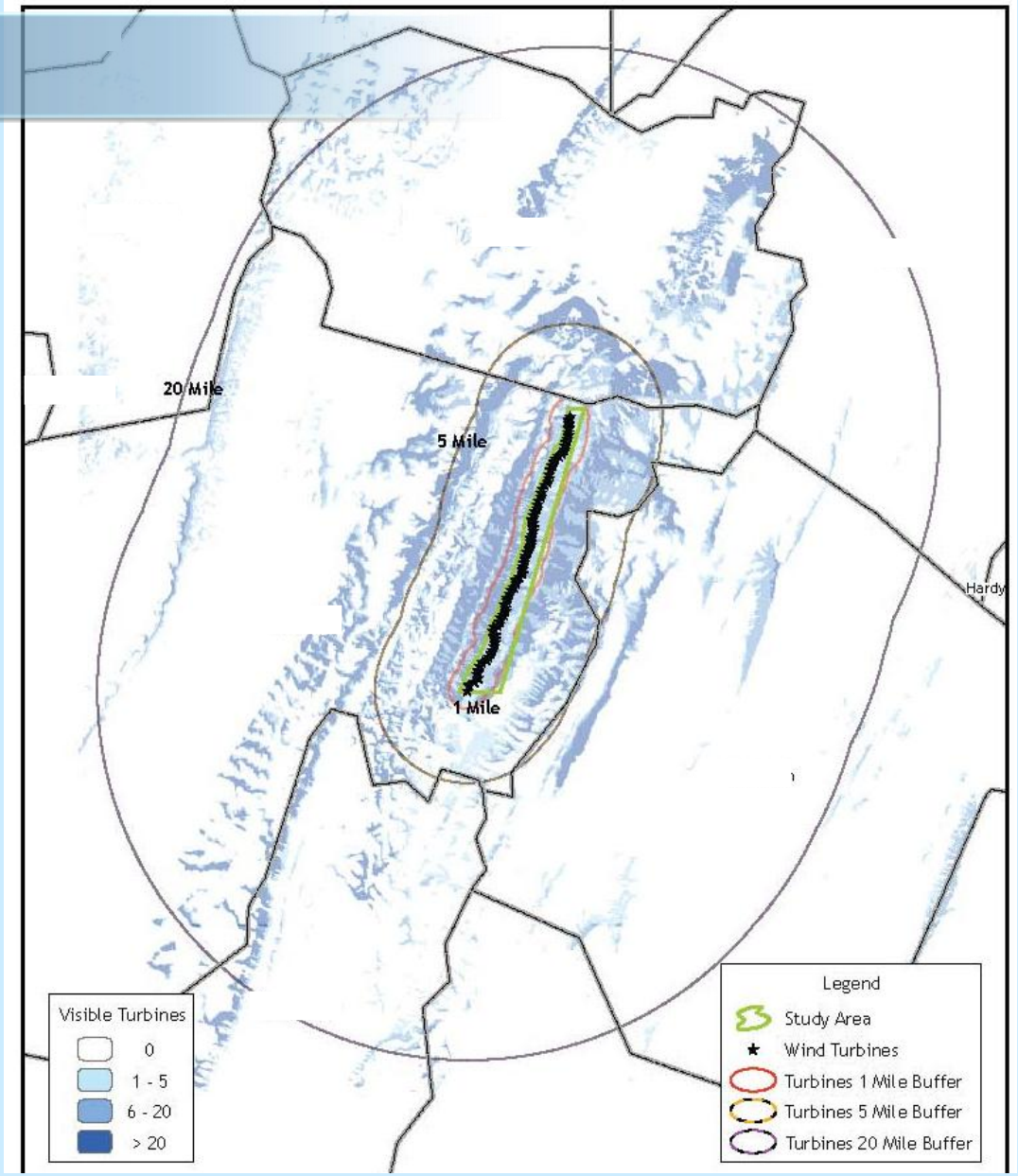
3 Critical Siting Issues

Viewshed, example site layout with selected environmental features



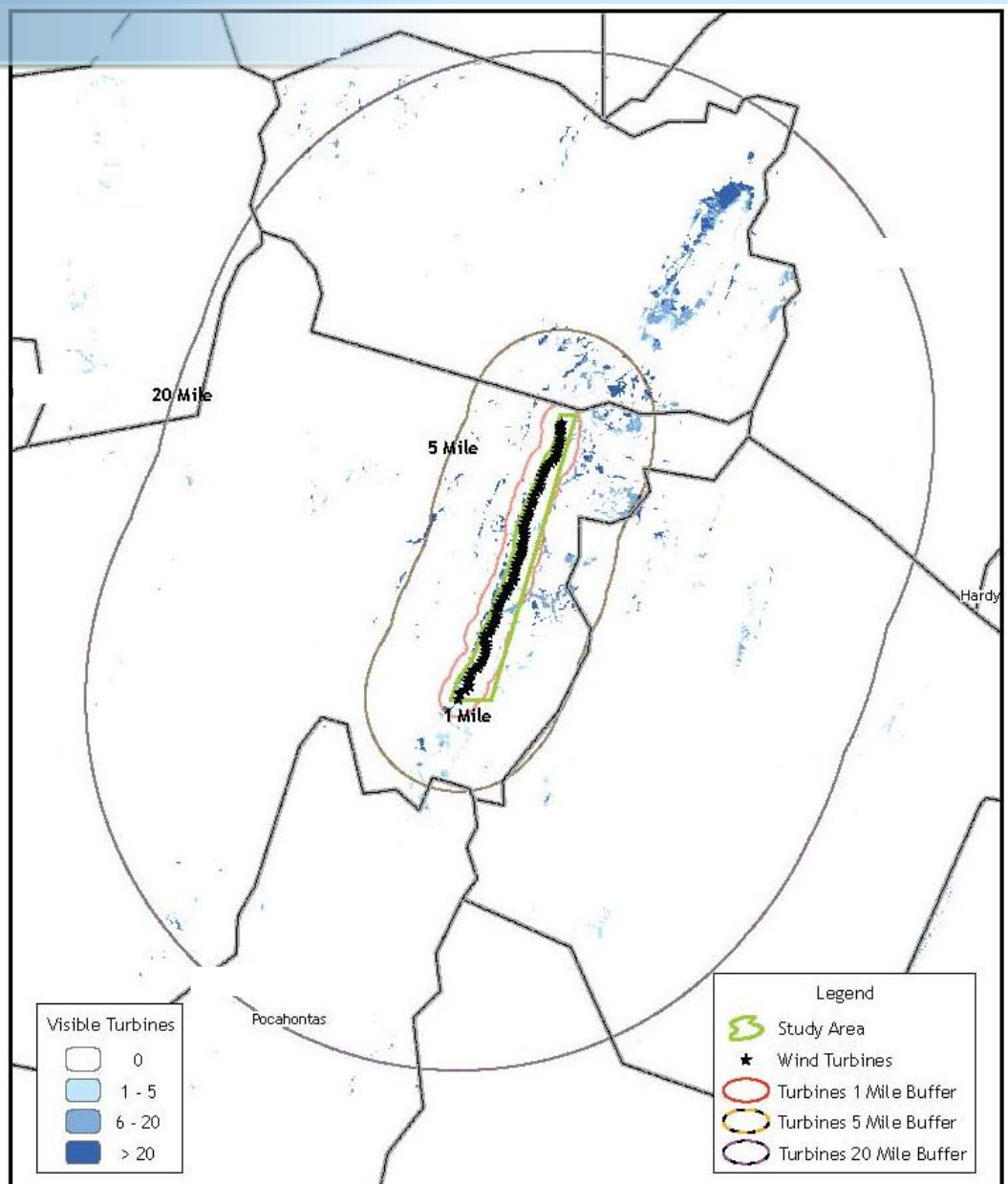
3 Critical Siting Issues

Viewshed, Terrain only



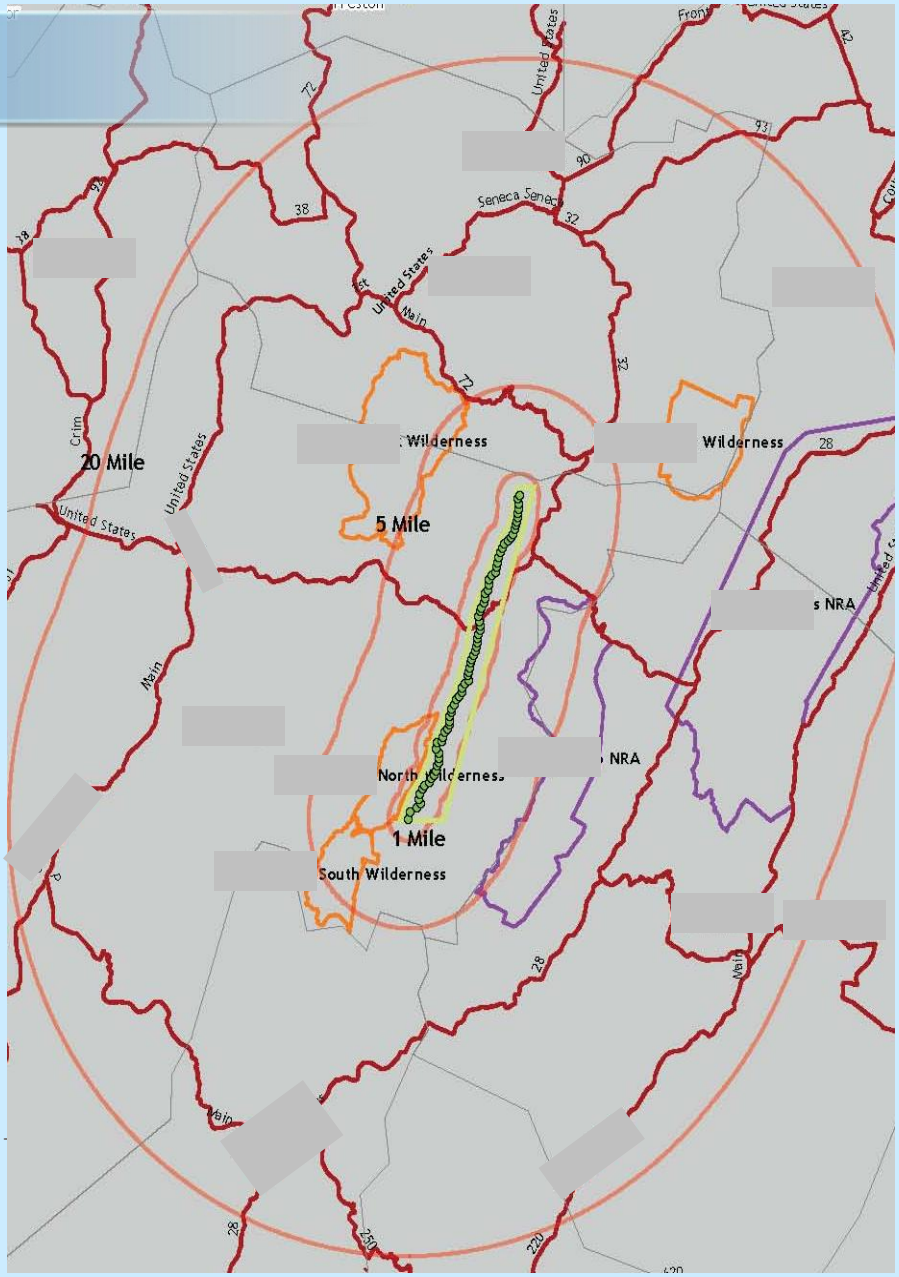
3 Critical Siting Issues

Viewshed, leaf-on



3 Critical Siting Issues

Viewshed with sensitive aesthetic resources

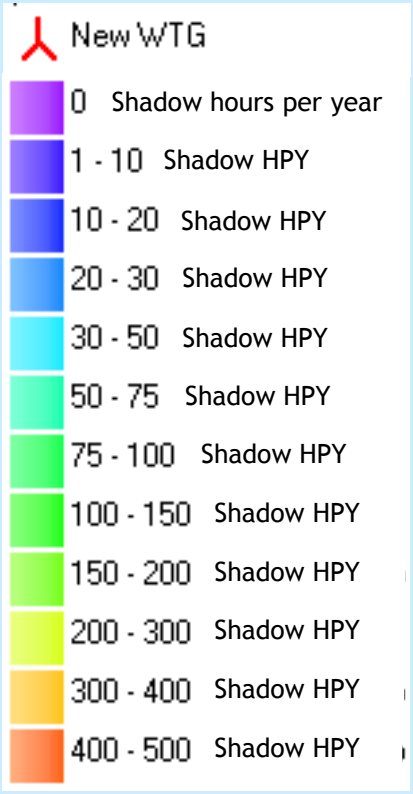


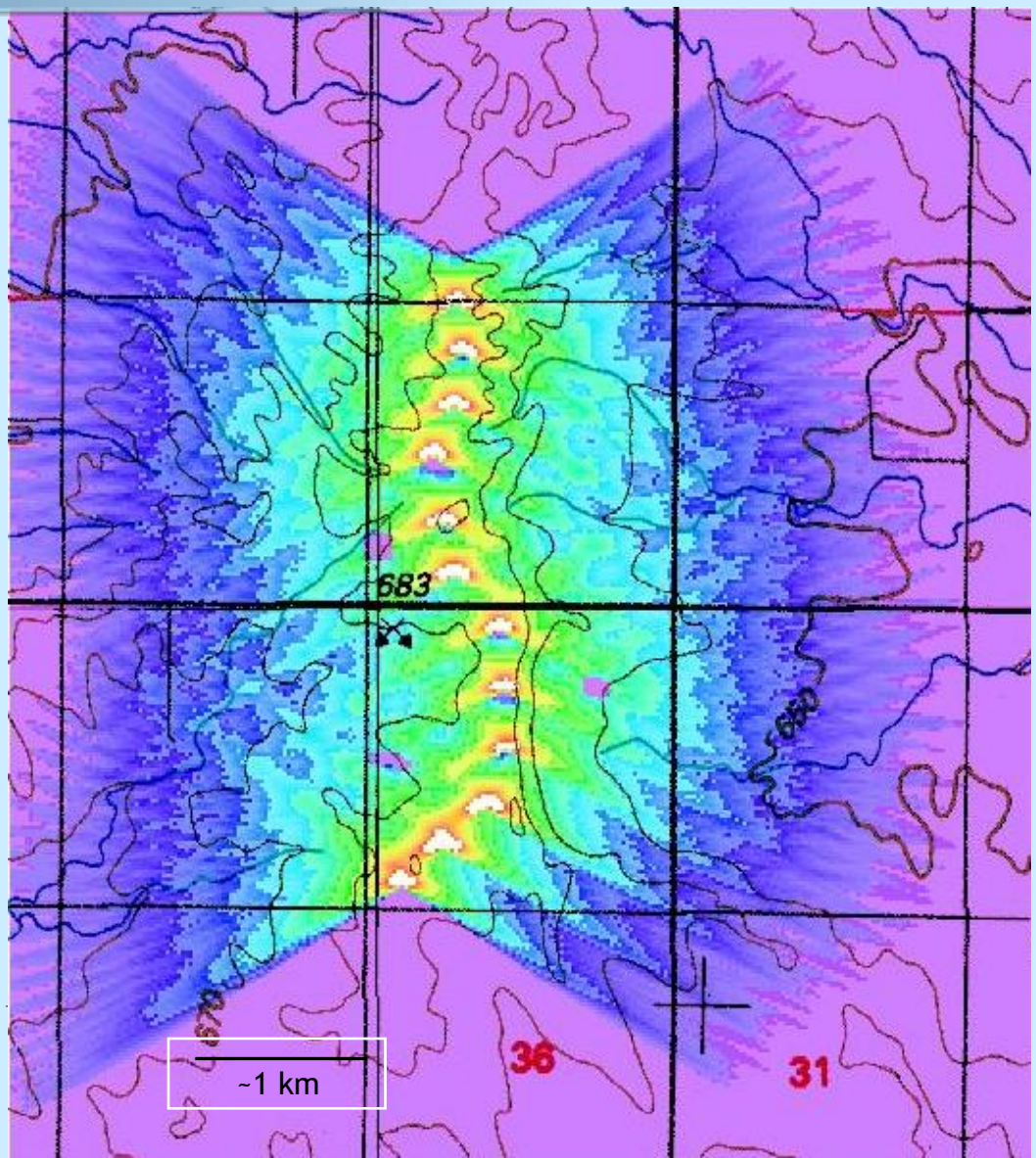
3 Critical Siting Issues

Photosimulation

3 Critical Siting Issues

Shadow Flicker

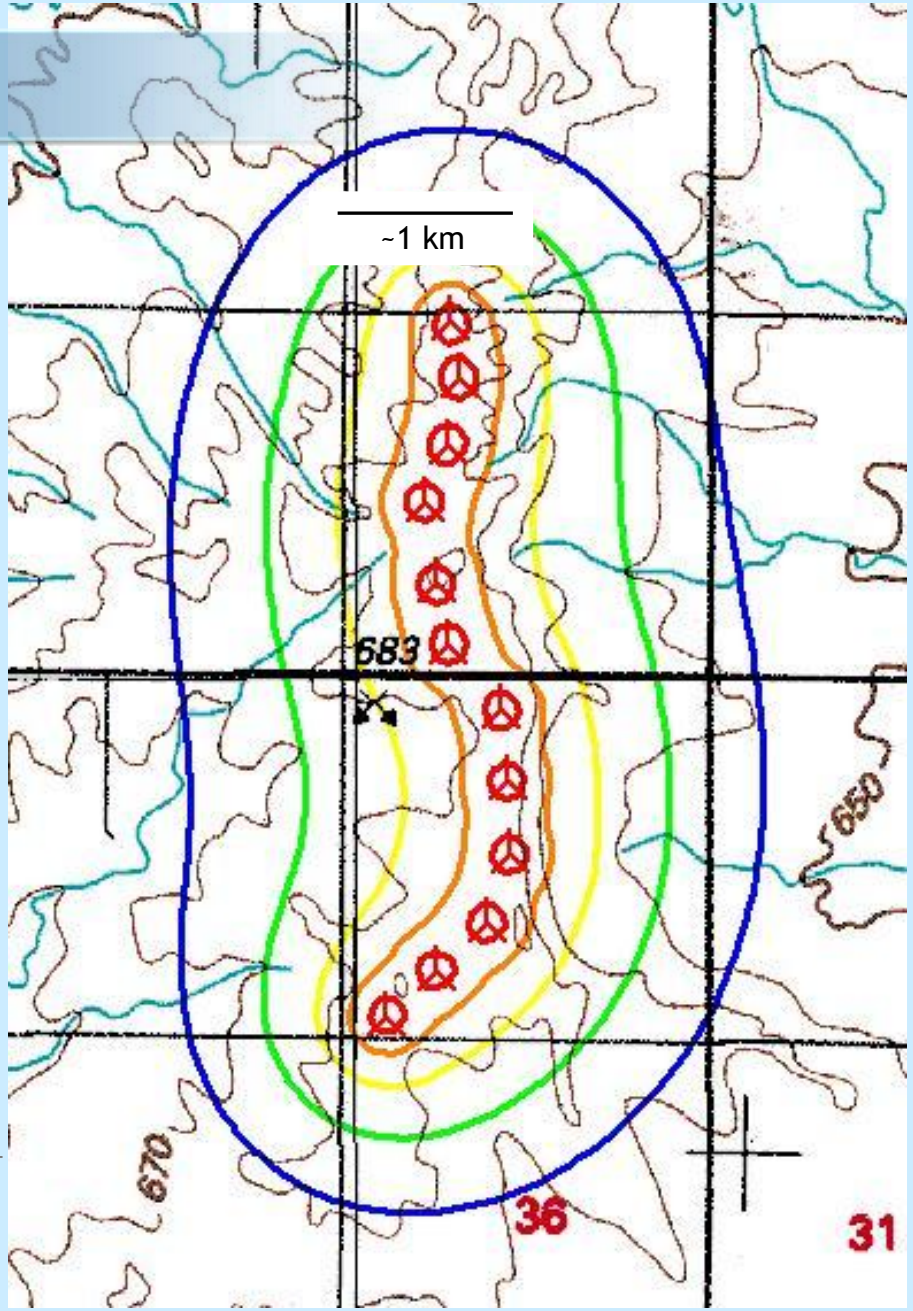




DEFINING ENVIRONMENTAL SOLUTIONS

3 Critical Siting Issues

Noise



3 Critical Siting Issues

Cultural Resources

- Historic Properties (viewshed)
- Archeology
- Recreation
- Cultural/Community Value

3 Critical Siting Issues

Avian & Wildlife Issues

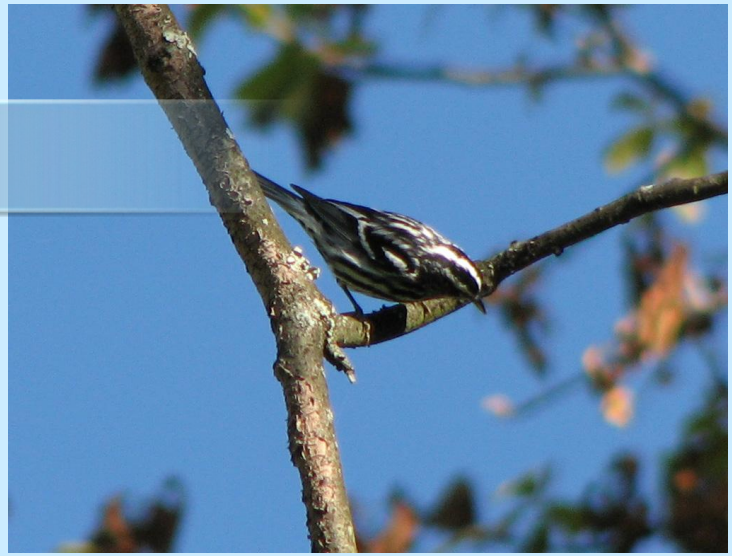
- Bats
- Birds
- Threatened & Endangered Species
- Other Concerns: Habitat Fragmentation, Displacement
- Pre and Post-Construction Surveys

3 Critical Siting Issues

Bats

- Endangered Species
- Non-listed Bats

3 Critical Siting Issues



Birds

- Migratory Bird Treaty Act
- Bald & Golden Eagle Protection Act

3 Critical Siting Issues

Other Environmental Impacts

- Wetlands
- Streams
- Natural Areas
- Wild & Scenic Rivers

3 Critical Siting Issues

Other Environmental Impacts

- NPDES, Erosion & Sediment Control, Floodplains
- Traffic
- Economics

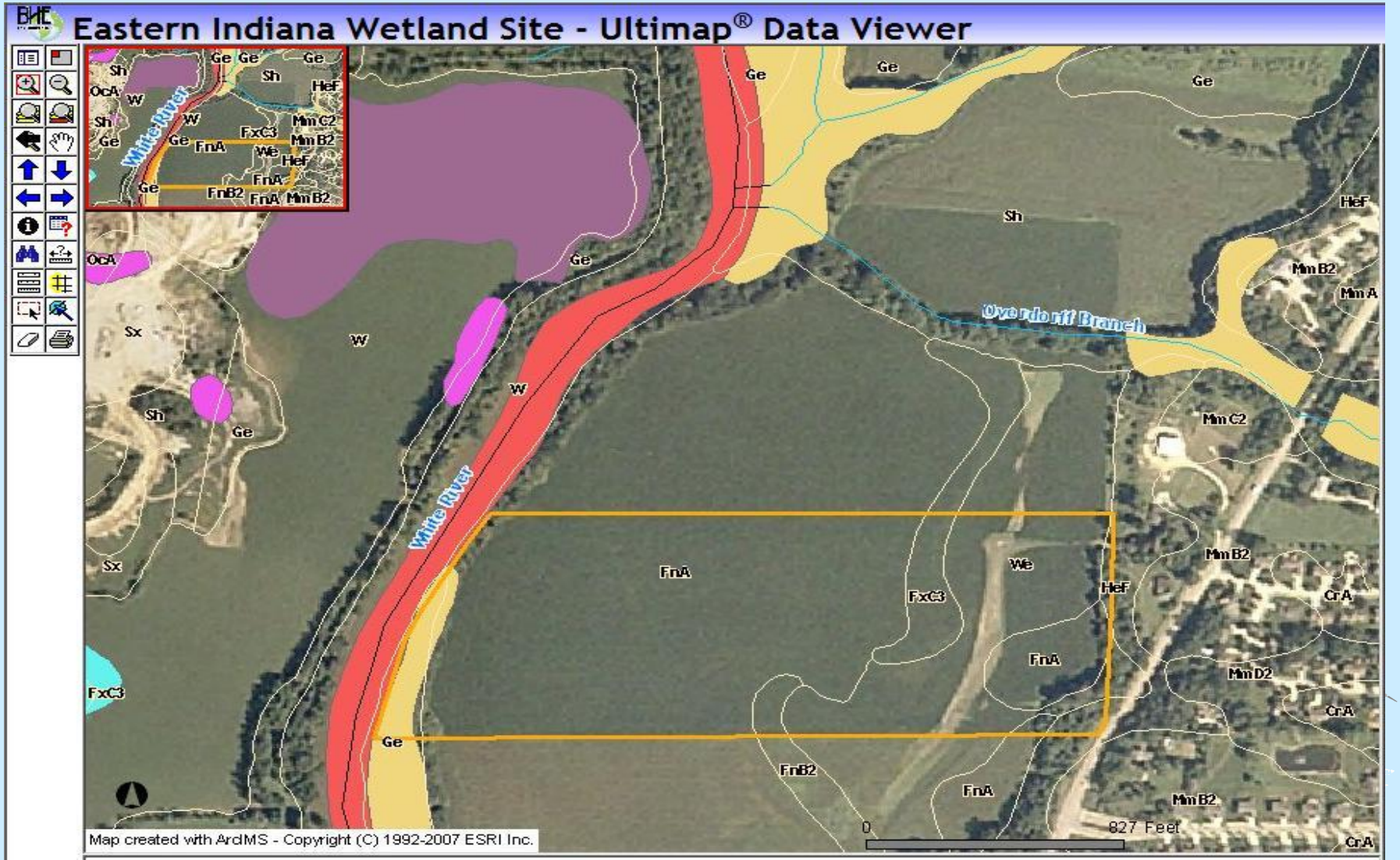
4 Managing the Siting Process

Bringing it all Together

- Visualize Your Project: GIS
- Watch Your Schedule: Gantt Charts

4 Managing the Siting Process

Visualize Your Project: GIS



4 Managing the Siting Process

Watch Your Schedule: Gantt Charts

Draft Example Project Schedule

ID	Task Name	Duration	Start	Finish
1	**Wind Project Siting Permit Requirements**	**366 days**	**Fri 6/1/07**	**Thu 7/31/08**
2	**404 Permit/401 Certification**	**361 days**	**Fri 6/1/07**	**Fri 7/25/08**
3	Waters of the US Field Delineation & GIS Mapping	74 days	Fri 6/1/07	Sat 8/25/07
4	Nationwide Permit Notification	20 days	Mon 8/27/07	Tue 9/18/07
5	Nationwide Permit Approval - Prepare and Submit Notification	45 days	Wed 9/19/07	Fri 11/9/07
6	Individual Permit Application	52 days	Tue 10/30/07	Fri 12/28/07
7	Individual Permit Approval	180 days	Sat 12/29/07	Fri 7/25/08
8	**USFWS & State Endangered Species & Wildlife Consultation**	**299 days**	**Fri 6/1/07**	**Wed 5/14/08**
9	Review Technical Letters & Finalize Scope of Studies	53 days	Fri 6/1/07	Wed 8/1/07
10	Avian and Bat Preconstruction Surveys	299 days	Fri 6/1/07	Wed 5/14/08
11	**NPDES Stormwater Discharge Permit**	**145 days**	**Sat 2/9/08**	**Sat 7/26/08**
12	Prepare SWPPP/GPP & Registration Application	20 days	Sat 2/9/08	Mon 3/3/08
13	State Review	45 days	Tue 3/4/08	Thu 4/24/08
14	Public Comment Period (Discretion)	30 days	Fri 4/25/08	Thu 5/29/08
15	Public Hearing (Discretion)	30 days	Fri 5/30/08	Thu 7/3/08
16	Respond to Comment & Approval	20 days	Fri 7/4/08	Sat 7/26/08
17	**NPDES Industrial Multi-Section Stormwater Permit**	**200 days**	**Wed 12/12/07**	**Thu 7/31/08**
18	Prepare SWPPP/GPP & Registration Application	20 days	Wed 12/12/07	Thu 1/3/08
19	State Review & Approval	180 days	Fri 1/4/08	Thu 7/31/08
20	**Cultural Resources (SHPO) Concurrence Process**	**325 days**	**Fri 6/1/07**	**Fri 6/13/08**
21	Scope of Work Requested and Authorized	16 days	Fri 6/1/07	Tue 6/19/07
22	Scope of Work submitted to SHPO for approval/comment	31 days	Wed 6/20/07	Wed 7/25/07
23	Scope of Work revised (as needed)	7 days	Thu 7/26/07	Thu 8/2/07
24	Final Scope of Work approved	7 days	Fri 8/3/07	Fri 8/10/07
25	Archival research and interested party consultation	31 days	Sat 8/11/07	Sat 9/15/07
26	Field research	62 days	Mon 9/17/07	Tue 11/27/07
27	Analysis & Reporting	93 days	Wed 11/28/07	Fri 3/14/08
28	Draft reports submitted to SHPO for approval/comment	31 days	Sat 3/15/08	Sat 4/19/08
29	Reports revised (as needed)	16 days	Mon 4/21/08	Thu 5/8/08
30	Final report to SHPO	1 day	Fri 5/9/08	Fri 5/9/08
31	Concurrence letter received from SHPO	30 days	Sat 5/10/08	Fri 6/13/08
32	**Flood Zone Construction Permit (if necessary)**	**30 days**	**Fri 6/27/08**	**Thu 7/31/08**
33	**Well Drilling Certificate (if necessary)**	45 days	Tue 6/10/08	Thu 7/31/08
34	**Permit to install individual sewer sytem (if necessary)**	45 days	Tue 6/10/08	Thu 7/31/08
35	**Right-of-Entry Permit**	45 days	Tue 6/10/08	Thu 7/31/08
36	**Building Permit**	45 days	Tue 6/10/08	Thu 7/31/08
37	**Dept. of Highways Permits/Approvals**	90 days	Fri 4/18/08	Thu 7/31/08

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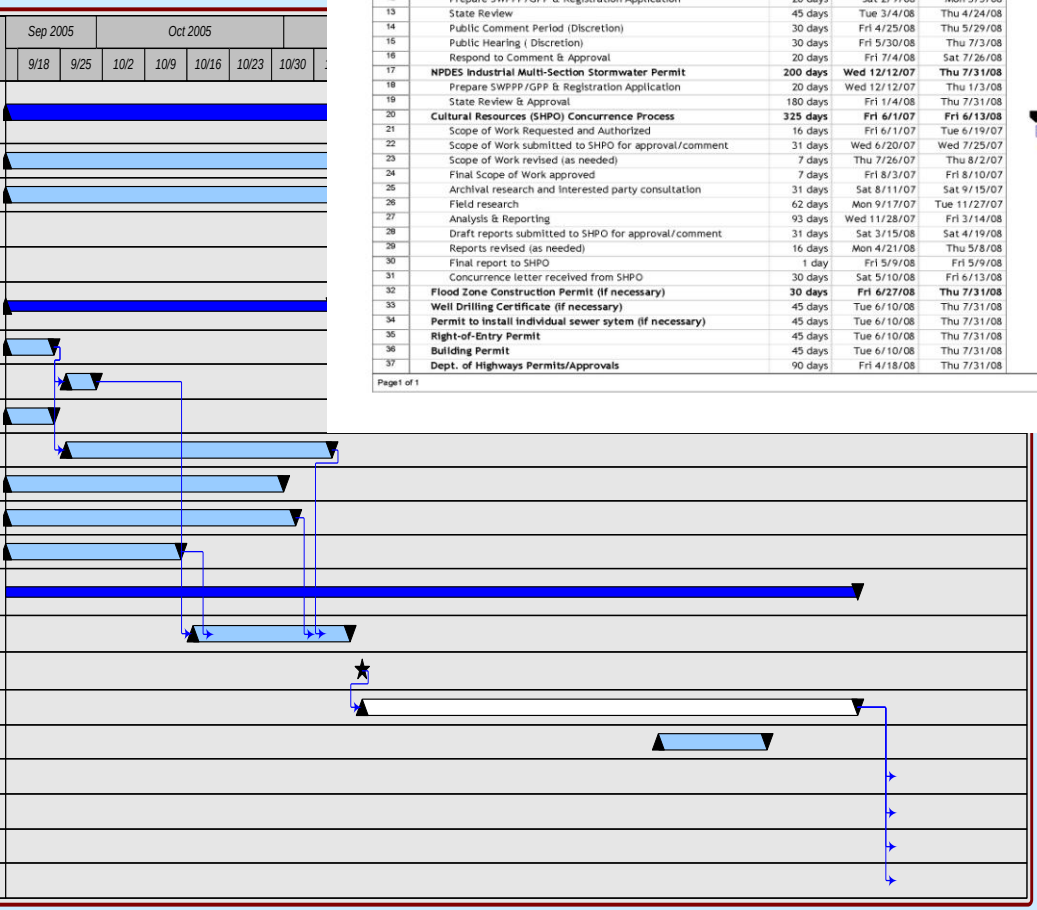
ID	Task Name	Start	Finish	Duration
1	**Task I Survey Services**	9/16/2005	11/25/2005	51d
2	Task Ia Project Area Boundary	9/16/2005	11/25/2005	51d
3	Task Ib ALTA and Topo	9/16/2005	11/25/2005	51d
4	Task Ic Construction Staking	8/30/2005	8/30/2005	0d
5	Task Id As-Built Survey	8/30/2005	8/30/2005	0d
6	**Task II Env Compliance, Surveys and Reporting**	**9/16/2005**	**11/8/2005**	**38d**
7	Task IIa Agency Scoping	9/16/2005	9/23/2005	6d
8	Task IIb Wetland and Floodplain	9/26/2005	9/30/2005	5d
9	Task IIc NPDES/ECP	9/16/2005	9/23/2005	6d
10	Task IId Cultural and Historical Survey	9/26/2005	11/8/2005	32d
11	Task IIe Comm/MW Impact Analysis	9/16/2005	10/31/2005	32d
12	Task IIf Noise Study	9/16/2005	11/2/2005	34d
13	Task IIg Visual Impact Analysis	9/16/2005	10/14/2005	21d
14	**Task III OPSB Support**	**8/30/2005**	**2/3/2006**	**114d**
15	Task IIIa OPSB Application (pertinent sections by BHE)	10/17/2005	11/11/2005	20d
16	*OPSB Application Submitted (by others)*	11/14/2005	11/14/2005	0d
17	*Compliance Review (by OPSB)*	11/14/2005	2/3/2006	60d
18	Task IIIb Response to OPSB Staff	1/2/2006	1/19/2006	14d
19	Task IIIc Attend OPSB Meetings	8/30/2005	8/30/2005	1d
20	Task IIId Defend Work Product	8/30/2005	8/30/2005	1d
21	Task IIIe Participate in Public Meetings	8/30/2005	8/30/2005	1d
22	Task IIIf Post Application Participation	8/30/2005	8/30/2005	1d



Q&A

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Connect to the Grid (Next)

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